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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/059,210	01/31/2002	Katsumi Oomori	2002-0089	7480

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EXAMINER
LEE, SIN J

ART UNIT	PAPER NUMBER
1752	

DATE MAILED: 07/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/059,210	Applicant(s) OOMORI ET AL.	
	Examiner Sin J Lee	Art Unit 1752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 22 April 2003 .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-12 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-12 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/291,116 .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. In view of the terminal disclaimer filed on April 22, 2003, the previously made obviousness-type double patenting rejections on claims 1-12 are hereby withdrawn.

2. Due to new grounds of rejections, the following rejections are made non-final.

Claim Rejections - 35 USC § 103

3. Claims 1-6, 9, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamachika et al (5,679,495) in view of Padmanaban et al (5,852,128).

Yamachika et al teach a radiation sensitive resin composition comprising a polymer which becomes alkali-soluble in the presence of an acid and a photoacid generator. For the present component (A) of claim 1, the prior art teaches (col.3, lines 25-53) that its polymer has a recurring unit of hydroxystyrene, a recurring unit of *t-butyl* (meth)acrylate, and a recurring unit C). As examples for the monomer which makes up the recurring unit C), the prior art teaches vinyl group-containing compounds and (meth)acryloyl group containing compounds. As specific examples for the vinyl group-containing compounds, the prior art include six kinds of compounds one of which is aromatic alkenyl compounds. Furthermore, as one of the four more specific examples for the aromatic alkenyl compounds, the prior art teaches *styrene*. See col.4, lines 42-50. Since there are only two general examples to choose from, it would have been obvious to one of ordinary skill in the art to choose vinyl group-containing compounds, and also

since there are only six kinds of compounds to choose from, it would have been obvious to one of ordinary skill in the art to choose aromatic alkenyl compounds such as styrene to be the monomer for recurring unit C) with a reasonable expectation of achieving a radiation sensitive resin composition excellent in pattern shape, sensitivity, contrast, developability. Yamachika furthermore teaches (in col.3, lines 58-61, col.4, lines 5-8, lines 14-21) the proportion of the hydroxystyrene recurring units, t-butyl (meth)acrylate recurring units, and the recurring unit C) to be 5-75%, 10-70%, and 0.5-50% respectively. These ranges overlap with present ranges for the monomeric units of the first copolymeric resin, and therefore, the prior art's teaching would have made the present ranges for the first copolymeric resin *prima facie* obvious. In the case "where the [claimed] ranges overlap or lie inside ranges disclosed by the prior art," a *prima facie* case of obviousness would exist which may be overcome by a showing of unexpected results, In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). Also, Yamachika clearly teaches in col.5, lines 9-19 that for their polymer (A), there may be used a mixed polymer consisting of at least *two polymer mixtures* of the polymers different in the proportions of the monomer a, the monomer b and the monomer c copolymerized within the above-mentioned range. Based on this teaching, it would have been obvious to one of ordinary skill in the art to use the mixture of two polymers which are different in the proportions of the monomers a, b, and c copolymerized within the above-mentioned range with a reasonable expectation of achieving a radiation sensitive resin composition excellent in pattern shape, sensitivity, contrast, developability. Although the prior art's range (i.e., 10-70%) for the t-butyl (meth)acrylate recurring unit does not

meet the present range (i.e., 2-8%) for the monomer unit © for the second copolymeric resin, it is the Examiner's position that the lower end of the prior art's range and the higher end of the present range is close enough and thus a *prima facie* case of obviousness would exist as to the present range which may be overcome by a showing of unexpected results. Where the claimed ranges and prior art do not overlap but are close enough that one skilled in the art would have expected them to have the same properties, a *prima facie* case of obviousness would also exist which may also be overcome by a showing of unexpected results, In re Titanium Metals corporation of America v. Banner, 227 USPQ 773 (Fed. Cir. 1985). Therefore, the prior art's teaching would render obvious present component (A) which is the combination of the first and second copolymeric resins. Also, with respect to present weight ratio of claim 12 for the first copolymeric resin to the second polymeric resin, it is the Examiner's position that the present weight ratio range would have been obvious to one having ordinary skill in the art at the time the invention was made, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

For the present component (B) of claim 1, Yamachika teaches (col.5, lines 20-29) that their photoacid generator includes onium slat compounds as well as four other kinds of compounds. Although Yamachika does not explicitly teach the presently claimed onium salt containing a fluoroalkyl sulfonate ion, such onium salts containing a fluoroalkyl sulfonate ion with 3-10 carbons as the anion are well known in the art. For example, see Padmanaban et al

(5,852,128) col.8, lines 48-67, col.9, lines 1-19, wherein the listed examples of onium salts to be used as photoacid generator include anions such as hexafluoropropane sulfonate and *nonafluorobutane sulfonate* (*which is presently claimed in claim 4*). In fact, almost half of the examples listed contain anions of hexafluoropropane sulfonate or nonafluorobutane sulfonate. Besides, Padmanaban et al indicate their preference for the onium salts having hexafluoropropane sulfonate as anion by claiming them in their claim 5. Based on the teachings of Yamachika in view of Padmanaban et al, it would be obvious for one ordinarily skilled in the art to use onium salts containing hexafluoropropane sulfonate or nonafluorobutane sulfonate taught by Padmanaban et al as Yamachika et al's acid generator with reasonable expectation that these photoacid generators would function the same way as Yamachika's onium salt photoacid generators. In col.7, lines 61-64, Yamachika et al teach the amount of the photoacid generator to be 0.05-20 parts by weight per 100 parts by weight of the polymer (A). Since this range overlaps with the present range, the prior art's range would have made the present range *prima facie* obvious. See In re Wertheim, supra. Therefore, Yamachika in view of Padmanaban would render obvious present component (B), and thus, Yamachika in view of Padmanaban would render obvious present inventions of claims 1-4, 9, and 12.

With respect to present claim 5, Yamachika teaches (col.4, lines 63-67) that the molecular weight of the polymer (A) is 1,500 to 300,000. Since this range overlaps with the present range, the prior art's teaching would have made the present range *prima facie* obvious. See In re Wertheim, supra.

With respect to present claim 6, Yamachika teaches (col.10, lines 50-60) the addition of an acid-diffusion controller into his radiation sensitive composition in order to improve pattern shape. As examples for the acid-diffusion controller, the prior art includes (col.10, lines 61-67, col.11, lines 1-4) secondary amine compounds as well as tertiary amine compounds, and specifically the prior art uses tripropylamine and tri-n-butylamine in their working examples (see Table 1 and col.19, lines 62-65). The prior art also teaches (col.11, lines 30-33) the amount of the acid-diffusion controller to be 0.001-10 parts by weight per 100 parts by weight of their polymer (A), and this range overlaps with the present range. Therefore, Yamachika in view of Padmanaban would render obvious present invention of claim 6.

4. Claims 7 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamachika et al (5,679,495) in view of Padmanaban et al (5,852,128) as applied to claim 1 above, and further in view of Sato et al (5,955,240).

Yamachika et al in view of Padmanaban et al is discussed above in Paragraph 3. Yamachika et al in view of Padmanaban et al do not teach present carboxylic acid compounds of claims 7 and 11. Sato et al teach (col.10, lines 34-42) adding an organic carboxylic acid compound to a positive photoresist composition in order to improve a sensitivity, a resolution, good width characteristic in focus depth and to achieve resist patterns with good profiles and good post-exposure storage stability. As examples for the organic carboxylic acid compound, the prior art first teaches (col.10, lines 43-49) six different kinds of compounds one of which is aromatic carboxylic acid compound (aromatic carboxylic acid compound is also taught as one of

the three *especially preferred kind* - see col.11, lines 27-29). Based on Sato's teaching, it is the Examiner's position that it would have been obvious for one of ordinary skill in the art to choose an aromatic carboxylic acid compound and use it in Yamachika et al's positive resin composition with a reasonable expectation of improving in sensitivity, resolution, good width characteristic in focus depth and obtaining resist patterns with good profiles and good post exposure storage stability. Since Sato et al teach (col.11, lines 62-67) that the proportion of the organic carboxylic acid compound to be 0.01 to 1%, and since this range overlaps with the present range of claim 7, the prior art's teaching would have made the present range *prima facie* obvious. See In re Wertheim, supra. Therefore, Yamachika et al in view of Padmanaban et al and Sato et al would render obvious present inventions of claims 7 and 11.

5. Claims 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamachika et al (5,679,495) in view of Padmanaban et al (5,852,128) as applied to claim 1 above, and further in view of Watanabe et al (5,972,559).

Yamachika in view of Padmanaban is discussed above in Paragraph 3. Yamachika teaches (col.11, line 1) triethylamine as one of the examples for their acid-diffusion controller. Watanabe et al teach (col.11, lines 22-31 and col.13, lines 5-9) the equivalence of triethylamine, triethanolamine, and N,N-dimethylacetamide as acid-diffusion suppressing compounds. Since the prior art teaches the equivalence of these three compounds as acid-diffusion controlling compounds, it would have been obvious to one of ordinary skill in the art to use triethanolamine or N,N-dimethylacetamide as Yamachika's acid diffusion controller with a reasonable

expectation that these compounds would work equally well as triethylamine in Yamachika's invention. Therefore, Yamachika et al in view of Padmanaban et al and further in view of Watanabe et al would render obvious present inventions of claims 8 and 10 (Since Yamachika teaches (col.11, lines 30-33) the amount of their acid-diffusion controller to be 0.001-10 parts by weight per 100 parts by weight of their polymer (A), and since this range overlaps with the present range of claim 8, Yamachika in view of Padmanaban and further in view of Watanabe would render obvious present invention of claim 8).

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is (703) 305-0504. The examiner can normally be reached on Monday-Friday from 8:30 am EST to 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ms. Janet Baxter, can be reached on (703) 308-2303. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9311 for after final responses or (703) 872-9310 for before final responses.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0661.

S. J. L.
S. Lee
July 10, 2003

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